

Name: _____

at1117paper: Complete the Square (v316)

Example

A square's edge length is x feet. A rectangle has a height of x feet and a width of 48 feet. Their combined area, found by adding the square's area and the rectangle's area, is 1273 square feet. What is the value of x ?

Example's Solution

$$x^2 + 48x = 1273$$

To complete the square, add $\left(\frac{48}{2}\right)^2 = 576$ to both sides.

$$x^2 + 48x + 576 = 1849$$

Recognize the left side is now a perfect-square trinomial. Factor the left side.

$$(x + 24)^2 = 1849$$

Undo the squaring.

$$x + 24 = \pm\sqrt{1849}$$

$$x + 24 = \pm 43$$

Subtract 24 from both sides.

$$x = -24 \pm 43$$

In this geometric example, we are only concerned about the positive solution. So,

$$x = 19$$

Question 1

A square's edge length is x feet. A rectangle has a height of x feet and a width of 58 feet. The total area, of the square and rectangle, is 840 square feet. What is the value of x ?

Question 2

A square's edge length is x feet. A rectangle has a height of x feet and a width of 56 feet. The total area, of the square and rectangle, is 1152 square feet. What is the value of x ?

Question 3

A square's edge length is x feet. A rectangle has a height of x feet and a width of 60 feet. The total area, of the square and rectangle, is 2236 square feet. What is the value of x ?